Claims

1. In combination, a device (7) for cleaning fire tubes (3) in a boiler (1), comprising a scraper member (14) that is fixed to a movement member (13) for moving said scraper member (14) through one fire tube (3) at a time, a guide (10) for positioning the scraper member (14) directly in front of the open end (4) of a fire tube (3) such that this is movable from the guide (10) into the fire tube (3) and conversely from the fire tube (3) into the guide (10), as well as a boiler (1) provided with fire tubes (3), which fire tubes (3) open at one end of the boiler (1), wherein the guide (10) is movable transversely with respect to the longitudinal direction of the fire tubes (3) on a frame (8) that is located at the end of the boiler (1) where the fire tubes (3) open, and wherein a flue box (2) is located at the end of the boiler (1) where the fire tubes (3) open, which flue box (2) has openings (17) that are each located opposite a fire tube (3), characterised in that said openings (17) are each provided with a closing valve (16) and the device (7) is provided with an operating mechanism (20) that can be brought into interaction with one of the closing valves (16) in each case for opening said closing valve (16).

2. Combination according to one of the preceding claims, wherein the guide (10) is mounted on a boom (9), which boom (9) is mounted on the frame (8) such that it is movable in the vertical and horizontal direction, and wherein the operating mechanism (20) is at the free end of the boom (9).

3. Combination according to one of the preceding claims, wherein the guide comprises a tube (10).

4. Combination according to one of the preceding claims, wherein the movement member (13) is flexible, such as a cable.

5. Combination according to Claim 3 or 4, wherein the tube (10) is movable in the longitudinal direction between a retracted position outside the flue box (2) and a projecting position in the flue box, wherein the openings (17) in the flue box (2) are each aligned with an associated fire tube (3), and wherein the tube (10), in the projecting position, forms an essentially straight guide for the scraper member (14) between the opening (17) and

associated fire tube (3).

6. Combination according to Claim 5, wherein drive means are provided for driving the movement member (13) though the tube (10), wherein the position where the drive means engage on the movement member is essentially on the axis of the opening (17) and associated fire tube (3).

7. Combination according to one of the preceding claims, wherein the scraper member (14) comprises a brush that has at least one open segment in cross-section.

8. Combination according to Claim 7, wherein the open segment or several open segments together leave between a quarter and half of the circular cross-section of the fire tube (3), preferably one third thereof, free.

9. Combination according to one of the preceding claims, wherein there is a contaminant discharge at the end of the fire tube (3) that opens into the flue box (2).

10. Combination according to Claim 9, wherein the contaminant discharge has a clearance that is kept free between the guide (10) when the latter is in the projecting position and the end of the fire tube (3) that opens into the flue box (2).

11. Combination according to Claim 9 or 10, wherein the tube (10) has a smaller diameter than the fire tube (3) to make an annular clearance between them.

12. Combination according to one of Claims 9 - 11, wherein the guide (10) has holes (29) at the end facing the fire tube (3) for discharging contaminants into the flue box (2).

13. Combination according to one of the preceding claims, wherein the guide (10) is movable vertically on the frame (8).

14. Combination according to Claim 1 or 2, wherein the guide (10) is movable horizontally on the frame (8).

15. Combination according to one of the preceding claims, wherein the tube (10) is mounted on the boom (9) such that it is movable in the longitudinal direction, and a guide tube (26) is provided that is fixed to the boom (9), which tube (10) is mounted in a telescopic manner (27) around the guide tube (26) and in which guide tube (26) the cable (13) is accommodated.

16. Combination according to Claim 15, wherein a compressed air supply (30) is connected to the guide tube (26).

17. Combination according to one of the preceding claims, wherein the cable (13) is fixed at one end to the scraper member (14) and at the other end to a winding member (12) such as a roller or drum and the like.

18. Combination according to one of the preceding claims, wherein the winding member (12) is supported on the boom (9).

19. Combination according to one of the preceding claims, wherein the closing valves (16) are each connected by means of a hinge (23) to the flue box (2) or a pipe section (26) fixed thereto, and the operating mechanism (20) comprises a movable arm (21) for turning the closing valve (16) about the hinge (23).

20. Combination according to Claim 19, wherein the closing valve (16) has a valve body (25) as well as a lever (22) that are on either side of the hinge (23), and the arm has a ram (21) that is movable in the longitudinal direction to make the lever (22) and valve body (25) tip as a result of contact with the free end of the ram (21).

21. Combination according to one of the preceding claims, wherein the closing valve (16) is held pressed in the closed position under the influence of gravity.

22. Combination according to one of the preceding claims, wherein the closing valve (16) is held pressed in the closed position under the influence of spring force.

23. Combination according to one of the preceding claims, wherein the closing

valves (16) are each connected by means of a bayonet fitting to the flue box (2) or a pipe section (26) fixed thereto, and the operating mechanism (20) comprises a movable arm (21) for pushing in and turning the closing valve (16).

24. Combination according to one of the preceding claims, wherein the guide comprises a tube (10) that is movable in the longitudinal direction thereof and that is provided on the outside, some distance away from its insertion end, with a gland (18) to provide a seal between the opening (17) and the tube (10) inserted therein.

25. Device (7) for use when cleaning the heating surface of a tube changer, such as the fire tubes (3) in a boiler (1), comprising a scraper member (14) that is fixed to a movement member (13) for moving said scraper member (14) though one fire tube (3) at a time, a guide (10) for positioning the scraper member directly in front of the open end (4) of a fire tube (3), such that said scraper member (14) is movable from the guide (10) into the fire tube (3) and conversely from the fire tube (3) into the guide (10), wherein the guide (10) is movable on a frame (8) transversely with respect to the longitudinal direction of the fire tubes (3), wherein the device is suitable for use with a boiler (1) having a flue box (2), into the end of which the fire tubes (3) open, which flue box (2) has an opening (17) provided with a closing valve (16) opposite each fire tube (3), characterised in that the device has an operating mechanism (20) that can be brought into interaction with a closing valve (16) for opening and closing said closing valve (16).